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REPORT OF PINE BEETLE SURVEYS on the WARM SPRINGS INDIAN RESERVATION, OREGON Season of 1946

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on the

WARM SPRINGS INDIAN RESERVATION, OREGON

Season of 1946

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TABLE OF CONTENTS

Page

SUMMARY OF RESULTS.....

INTRODUCTION..... 1

RESULTS OF THE 1946 SURVEY..... 1

Losses in 1945..... 1

Estimated Losses for 1946..... 2

Losses in Cutover Stands..... 2

GENERAL TREND OF PINE BEETLE LOSSES..... 3

RECOMMENDATIONS..... 4

Table 1. Results of the 1946 Survey - Ponderosa Pine Timber Killed by Insects on 320-Acre Check Plots

Figure 1. Average Board Foot Per Acre Losses, 1937 - 1946

SUMMARY OF RESULTS

1945 Losses (Complete records)

Primary Insect: Western pine beetle in ponderosa pine

Estimated Gross Mortality for 1945:

No. of Trees	Volume (Bd. Ft.)	Board Feet Per Acre	Percent of Stand
30,000	18,000,000	55	0.8

Trend: Upward since 1943

Classification: Moderate epidemic

1946 Losses (Incomplete records)

Primary Insect: Same

Probable Trend: Continuing upward from 1945 and probably about 28 percent higher.

Recommendations: Direct control operations not necessary. Extension of selection cutting to other units as rapidly as possible.

REPORT OF PINE BEETLE SURVEY

on the

WARM SPRINGS INDIAN RESERVATION

Season of 1946

INTRODUCTION

During the period September 30 - October 3 another annual cooperative survey to follow the trend of pine beetle infestations and to determine the need for control work in the ponderosa pine stands of the Warm Springs Indian Reservation was completed. The field work, which was again limited to a 100 percent recruise of six virgin 320-acre check plots, was conducted by C. E. Chester and R. Long of the Indian Service and the writer. Mr. T. Courtney, also of the Indian Service, instructed Mr. Long in the art of compass work and assisted in cruising three check plots. Mr. Chester compiled the field data for Table 1. A brief examination was also made of a portion of a recently cut over area in the Schoolie Unit.

RESULTS OF THE 1946 SURVEY

The 1946 survey completed the loss records for 1945 and gave partial data on current ponderosa pine mortality. Practically all of the losses have been caused by the western pine beetle (Dendroctonus brevicomis Lec.) with the mountain pine beetle (D. monticolae Hopk.), species of engraver beetles (Ips sp.) and flatheaded borers (Melanophila sp.) accounting for a minor portion of the annual mortality.

Losses in 1945

Pine beetle losses on the check plots in 1945 averaged 10 percent higher than in 1944 (Table 1). The gross 1945 losses varied from 87 to 192 board feet per acre or 0.57 to 2.05 percent of the stand. The average 1945 losses were 126 board feet per acre or 1.14 percent of the stand. Heaviest losses were again found in the fringe-type stands of the MillerFlat plot and in the mixed stands of the Twin Butte plot. Four of the six survey plots showed definite increases in insect-caused losses. Two plots showed losses equal to or slightly below those of 1944.

For the reservation as a whole the gross drain caused by pine beetles in 1945 was estimated to be 30,000 trees and 18,000,000 board feet. This is approximately 59 trees per section, 55 board feet per acre or 0.8 percent of the stand volume.

Estimated Losses for 1946

Approximately 65 percent of the total losses for the year on the check plots was marked at the time of the 1946 survey. Pine beetle losses in 1946 will be higher on three plots than they were in 1945 but lower on the remaining three plots. The 1946 mortality will probably average 28 percent higher than that of 1945.

In contrast to the 1945 infestation, current pine beetle attacks were aggressive and group killings were evident on nearly all check plots. On the Bear Springs plot two groups containing 11 and 18 trees respectively were marked. On the Ryan Road plot one group of 13 trees was found. The groups on the other plots ranged from 2 to 6 trees.

The trees in most of these groups had been killed by the first brood of beetles which emerged from trees killed in 1945. Only a few groups contained overwintering larvae. From this, it was concluded that a high percentage of the 1946 mortality occurred by mid-summer and, while the total loss for 1946 will be higher than that of 1945, it will not be excessive for this reservation. The status of the western pine beetle will have to be carefully checked during the next survey in order to determine whether direct control measures should again be instituted.

Losses in Cutover Stands

Cutting of ponderosa pine on a selection basis was started on the Schoolie Unit of the Warm Springs Indian Reservation in 1942. For the first two years progress was slow because this was a new operation and roads had to be developed, equipment and labor were scarce and some time was lost in 1943 in salvaging windthrown trees over a large area around He He Butte. During the last two years working conditions have improved and labor and logging equipment have become more plentiful so that the acreage cut over has increased each year.

Prior to 1946 there was little time to check on the activities of insects in the cutover areas. On October 4, Forest Supervisor Walter, Mr. Chester and the writer made a hurried examination of a small portion of the recently cutover stand in Section 8, Township 8 South, Range 10 East. While no detailed notes were taken, we did obtain a general impression of the conditions on the reserve stands.

The marking rules employed on this unit give primary recognition to trees in risk classes 3 and 4 as well as to other silviculturally undesirable trees (leaning trees, badly fire-scarred trees, trees growing on small hummocks and likely to be windthrown, etc.).

Because of the condition of the stands, this cutting has removed from 65 to 75 percent of the stand volume but has left a stand of healthy vigorous trees. The reserve stands appear to be satisfactorily stocked and are in decided contrast to the decadent, high hazard original stands. In the area examined on October 4 no insect-killed trees were noted and very few trees of doubtful risk were evident which should have been removed at the time of logging.

Fires, both surface and ground, have swept through a large portion of the cutover area north of Old Mill. The presence of large numbers of fire-scorched trees favors the build-up of insect populations and this area will probably need to be relogged in order to salvage the badly scorched trees before they are attacked and rendered useless by insects.

It would be very desirable to establish a series of 160 acre plots (to be cruised at the time of the annual survey) in order to follow the course of insect activities in these reserve stands. It would also be desirable to establish a 10 acre plot inside the larger plots on which all trees would be tagged and coded to determine the characteristics of the trees on the reserve stands that are killed by insects.

GENERAL TREND OF PINE BEETLE LOSSES

Pine beetle losses on the Warm Springs Indian Reservation have been at a high level for many years. Annual direct control projects were conducted until 1940 to halt the excessive depletion in the mature and overmature stands. In spite of these efforts, annual losses remained high. The general trend of pine beetle losses during the 10-year period 1937-1946 is shown in Figure 1. For this chart, the average board foot losses for all check plots cruised during a given year were used.

As shown in Figure 1, the trend of pine beetle losses has been erratic. From a high of 204 board feet per acre in 1940, pine beetle mortality dropped sharply to a low of 93 board feet per acre in 1941. While the trend has been generally upward since 1941, the level of recent losses has not been excessive considering the past history of the reservation. The estimated losses for 1946 have been placed at 162 board feet per acre and are higher than any year in the past ten year period except 1941.

It is difficult to explain the sudden drop in pine beetle losses in 1941. No control work was done during the winter of 1940-1941 and the records of the Weather Bureau show that minimum temperatures for that winter were not low enough to cause mortality to the overwintering larvae. However, during the winter of 1942-1943, some pine beetle mortality probably occurred on the reservation.

The Weather Bureau records show that a very sudden and severe cold spell occurred during the second half of January 1943 with a minimum temperature of -47 degrees F. at Meacham. At Warm Springs Agency the low for this cold spell was -14 degrees F. In all probability some pine beetle mortality occurred during this spell because the losses on the check plots dropped abruptly in 1943. However, if mortality did occur the benefits were not lasting for the losses quickly assumed their upward trend in 1944. Over most of the pine region of Oregon and Washington, growing conditions improved greatly in 1943, 1944 and 1945. In all probability the reduction in recent pine beetle losses has been due to a combination of factors - improved tree growth and winter mortality.

RECOMMENDATIONS

In view of the definite upward trend of pine beetle losses since 1943 and the group killing and probable heavy mortality of 1946, the question of control - either direct or indirect - becomes important. It may be advisable to again consider the institution of direct control work in some of the stands that cannot be opened up to sanitation-salvage logging operations at the present time. However, if at all possible, the extension of sanitation-salvage operations to a greater part of the reservation should be given first consideration. The heavy losses and the high quality timber being killed in and around Twin Buttes warrant immediate attention with sanitation-salvage logging as a possible solution. If such an operation cannot be started in this area in the very near future, then direct control work should be planned.

The high losses and the badly depleted fringe-type stands in the vicinity of Miller Flat should be given attention. Here, a utilization cut would seem to be the proper solution if present excessive depletion is to be stopped.

During the coming season, the pine beetle situation on this reservation needs to be carefully checked with both intensive and extensive surveys.

An examination should be made of the condition of the fire-scorched trees in the cutover stands. If necessary, portions of this area should be relogged in order to salvage the trees before they are lost through insect attacks.

If possible, a series of 160 acre check plots should be established in the cutover areas of the reservation to follow the trend of pine beetle infestations in the reserve stands. One 10 acre plot on which all trees would be tagged and coded should also be established inside the larger 160 acre plots.

Table 1. Results of the 1946 Survey on the Warm Springs Indian Reservation.
Ponderosa Pine Timber Killed by Insects on 320 Acre Check Plots

Check Plots				1945 Losses				
Name & Location	No.	Acres	Pine Volume (MBM)	No. Trees	Total	Per Acre	% of Stand	Ratio to 1944
Bear Springs T6S, R11E, Sec.19S/2	5	320	3,350	49	34,190	107	1.02	.99
Ryan's Road T9S, R10E,Sec/15E/2	6	320	2,830	52	37,800	118	1.34	1.33
Miller Flat T9S, R11E, Sec/8W/2	7	310	2,350	121	48,130	155	2.05	1.14
Twin Butte T10S, R10E, Sec/5W/2	12	320	5,980	54	61,380	192	1.03	.89
Metolius Beach T10S, R11E, Sec/32W/2	14	320	4,830	52	27,770	87	.57	1.21
Tenino Burn T10S, R11E, Sec/4S/2	20	300	1,540	64	29,660	99	1.92	1.44
Total 6 Plots		1,890	20,880	392	238,930	126	1.14	1.10
Average Per Plot		315	3,480	65	39,820	126	1.14	1.10

FIGURE 1. Average board foot per acre loss on pine beetle survey check plots of the Warm Springs Indian Reservation, 1937 - 1946